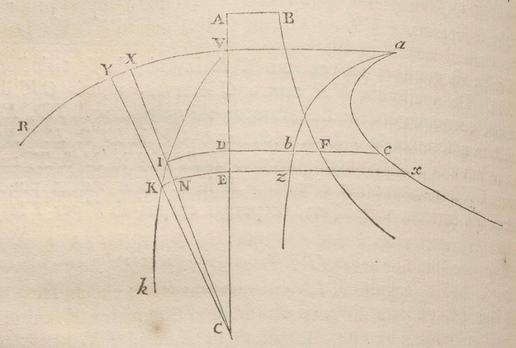
De Motu Corporum

id eſt, ſi detur quantitas aliqua Q, & altitudo IC nominetur A, ut $\frac{Q}{A}$. Hanc quantitatem $\frac{Q}{A}$ nominemus Z, & ponamus eam eſſe magnitudinem ipſius Q ut ſit in aliquo caſu $\surd ABFD$ ad Z ut eſt IR ad KN, & erit in omni caſu $\surd ABFD$ ad Z ut IK ad KN, &



$ABFD$ ad ZZ ut IKq ad KNq, & diviſim $ABFD-ZZ$ ad ZZ ut IN *quad.* ad KN *quad.* ideoque $\surd\overline{ABFD-ZZ}$ ad Z ſeu $\frac{Q}{A}$ ut IN ad KN, & propterea $A \times KN$ æquale $\frac{Q \times IN}{\surd\overline{ABFD-ZZ}}$. Unde cum $YX \times XC$ ſit ad $A \times KN$ ut CXq ad AA, erit rectangulum $XY \times XC$ æquale $\frac{Q \times IN \times CX\ quad.}{AA\surd\overline{ABFD-ZZ}}$. Igitur ſi in perpendiculo DF capiantur ſemper Db, Dc ipſis $\frac{Q}{2\surd\overline{ABFD-ZZ}}$, $\frac{Q \times CX\ quad.}{2AA\surd\overline{ABFD-ZZ}}$ æquales reſpective, & deſcribantur curvæ lineæ ab, ac, quas puncta b, c perpetuo tangunt; deque puncto V ad lineam AC erigatur perpendiculum Va abſcindens areas curvilineas $VDba$, $VDca$, & erigantur etiam ordinatæ Ez, Ex: quoniam rectangulum $Db \times IN$ ſeu $Dbze$ æquale eſt dimidio rectanguli

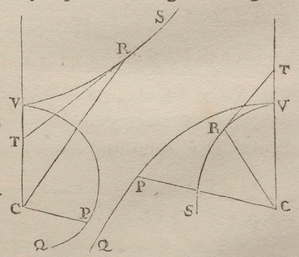
Liber Primus.

guli $A \times KN$ ſeu triangulo ICK; & rectangulum $Dc \times IN$ ſeu $Dcxe$ æquale eſt dimidio rectanguli $YX \times XC$ ſeu triangulo XCY; hoc eſt, quoniam arearum $VDba$, VIC æquales ſemper ſunt naſcentes particulæ $Dbze$, ICK, & arearum $VDca$, VCX æquales ſemper ſunt naſcentes particulæ $Dcxe$, XCY, erit area genita $VDba$ æqualis areæ genitæ VIC, ideoque tempori proportionalis, & area genita $VDca$ æqualis ſectori genito VCX. Dato igitur tempore quovis ex quo corpus diſceſſit de loco V, dabitur area ipſi proportionalis $VDba$, & inde dabitur corporis altitudo CD vel CI; & area $VDca$, eique æqualis ſector VCX una cum ejus angulo VCI. Datis autem angulo VCI & altitudine CI datur locus I, in quo corpus completo illo tempore reperietur. *Q. E. I.*

Corol. 1. Hinc maximæ minimæque corporum altitudines, id eſt, apſides trajectoriarum expedite inveniri poſſunt. Sunt enim apſides puncta illa in quibus recta IC per centrum ducta incidit perpendiculariter in trajectoriam VIK: id quod fit ubi rectæ IK & NK æquantur, ideoque ubi area $ABFD$ æqualis eſt ZZ.

Corol. 2. Sed & angulus KIN, in quo trajectoria alicubi ſecat lineam illam IC, ex data corporis altitudine IC expedite invenitur; nimirum capiendo ſinum ejus ad radium ut KN ad IK, id eſt, ut Z ad latus quadratum areæ $ABFD$.

Corol. 3. Si centro C & vertice principali V deſcribatur ſectio quælibet conica VRS, & a quovis ejus puncto R agatur tangens RT occurrens axi infinitæ producto CV in puncto T; dein juncta CR ducatur recta CP, quæ æqualis ſit abſciſſæ CT, angulumque VCP ſectori VCR proportionalem conſtituat; tendat autem ad centrum C vis centripeta cubo diſtantiæ locorum a centro reciproce proportionalis, & exeat corpus de loco V juſta cum velocitate ſecundum lineam rectæ CV perpendicularem: progredietur corpus illud in trajectoria VPQ quam punctum P perpetuo tangit; ideoque ſi conica ſectio VRS hyperbola ſit, deſcendet idem ad centrum: Sin ea ellipſis ſit, aſcendet illud perpetuo & abibit



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